National Aeronautics and Space Administration
Fleet Alternative Fuel Vehicle Program Report for Fiscal Year 2004
December 29, 2004

This National Aeronautics and Space Administration (NASA) Fleet Alternative Fuel Vehicle (AFV) Report for Fiscal Year (FY) 2004 presents the Agency's data on the number of alternative AFVs acquired in FY 2004, and its planned and projected acquisitions for FY 2005 and FY 2006. This report has been developed in accordance with the Energy Policy Act of 1992 (EPAct) (42 U.S.C. 13211-13219) as amended by the Energy Conservation Reauthorization Act of 1998 (Public Law 105-388) (ECRA), and Executive Order (E.O.) 13149 (signed by the President in April 2000). As shown in Figure 1, NASA exceeded the 75 percent AFV-acquisition requirement for 125 vehicles by acquiring 330 total credits in FY 2004. Attachment A provides detailed information on the number and types of light-duty vehicles leased or purchased by NASA in FY 2004.

Additionally, NASA successfully met the E.O. goal of a 1 mile per gallon (mpg) fuel economy increase in FY 2002, and is making significant progress towards meting the Executive Order goal of 3 mpg by FY 2005. Furthermore, due to an aggressive AFV Strategy and procurement of AFV fueling infrastructure, NASA is on track to meet the requirement that alternative fuels must be used in AFVs more than 50% of the time in FY 2005.

Legislative Requirements

EPAct requires that 75 percent of all covered light-duty vehicles acquired for Federal fleets in FY 1999 and beyond must be AFVs (where the fleets have 20 or more vehicles, are capable of being centrally fueled, and are operated in a metropolitan statistical area with a population of more than 250,000 based on the 1980 census). Certain emergency, law enforcement, and national defense vehicles are exempt from these requirements. EPAct also sets a goal of using replacement fuels to displace at least 30 percent of the projected consumption of motor fuel in the United States annually by the year 2010. The **ECRA of 1998** amended EPAct to allow one alternative fuel vehicle acquisition credit for every 450 gallons of pure biodiesel fuel consumed in vehicles over 8,500 pounds gross vehicle weight rating. "Biodiesel credits" may fulfill up to 50 percent of an agency's EPAct requirements. The head of each Federal agency must also prepare and submit a report to Congress outlining the agency's AFV acquisitions and future plans by November 13th each year. **E.O. 13149** directs Federal agencies operating a fleet of 20 or more vehicles within the United States to reduce their annual petroleum consumption by at least 20 percent by the end of FY 2005 (compared to FY 1999 levels) by using alternative fuels in AFVs more than 50 percent of the time, improving the average fuel economy of new light-duty petroleum-fueled vehicle acquisitions by 1 mpg by FY 2002 and 3 mpg by FY 2005, and using other fleet efficiency measures.

NASA Approach to Compliance with EPAct and E.O. 13149

To achieve compliance with the legislative mandates of EPAct and E.O. 13149, NASA has developed an aggressive compliance strategy including the acquisition of 75 percent of new, covered light-duty vehicles as AFVs, and use alternative fuel in these vehicles a majority of the time. NASA will also continue to acquire light duty vehicles with a higher fuel economy, and further reduce petroleum consumption by using biodiesel fuel in most diesel vehicles.

NASA also recognizes that AFV fueling infrastructure is extremely limited in most areas of the country. As such NASA has or intends to develop AFV fueling infrastructure at those NASA Center's where it is not readily commercially available. Additionally, each NASA Center now reports periodically during NASA's internal institutional review on compliance with EPAct and E.O. 13149.

NASA Fleet Compliance for FY 2004

Figure 1 is a graphical depiction of AFV acquisitions by NASA's fleet in FY 2001, 2002, 2003, and 2004. NASA acquired 308 light-duty vehicles (LDVs) during FY 2004 of which 167 were EPAct covered LDVs. Of the total 308 LDVs acquired, 269 were AFVs. NASA also gained 61 credits for biodiesel fuel use and for acquiring dedicated light, medium, and heavy-duty AFVs, for a total of 330 credits, thereby exceeding EPAct requirements of 75% by 123 percentage points.

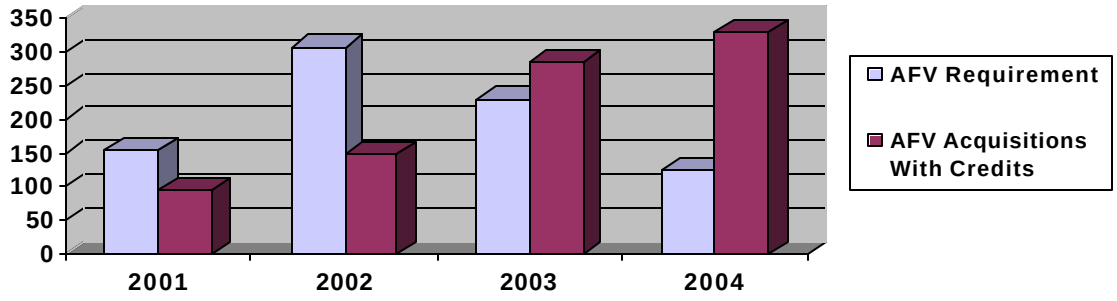

Figure 1. Summary of [AGENCY]'s FY 2004 AFV Acquisitions

A number of vehicles that were leased and purchased by NASA were not "covered" vehicles. Of the total of 308 light-duty vehicles acquired in FY 2004, the following were not counted for compliance:

- 78 were in fleets located outside covered metropolitan statistical areas (MSAs)
- 49 were exempt as law enforcement vehicles
- 10 were exempt due to geographic assignment

Improved Fuel Economy

Baseline fleet average fuel economy for covered, conventional petroleum light-duty vehicles was 18 mpg in FY 1999. In FY 2004, NASA achieved a fleet average fuel economy of 20.6 mpg. NASA expects to exceed the 3 mpg improvement goal for FY 2005.

NASA's Fleet AFV Acquisitions for FY 2005 and FY 2006

Attachments B and C provide detailed information on planned and projected vehicle acquisitions for NASA in FY 2005 and FY 2006. In FY 2005, NASA is planning to acquire a cumulative total of 603 light-duty vehicles of which 432 will be EPAct covered. NASA is planning of acquiring 524 total AFVs during FY 2005, exceeding the EPAct requirement of 324 AFVs

Special Projects of the NASA Fleet Related to AFV and Infrastructure Acquisitions

Significant AFV fueling infrastructure projects are currently underway at several NASA Centers. During FY 2004 NASA brought on line three additional E-85 fueling stations. These stations in addition to the conversion of existing diesel tanks to Bio Diesel (B-20) will significantly decrease NASA's petroleum consumption and increase our percentage of AFV fuel used in AFV's

Petroleum Savings

Since it is difficult, if not impossible, to project petroleum savings for FY 2005 and FY 2006 based upon the estimated AFV acquisitions, improvements in fuel economy, and fleet efficiency, petroleum savings are reported for only FY 2004 based on actual data at hand for FY 1999 and FY 2004.

In FY 1999 NASA's estimated baseline petroleum consumption was 1,521,959 GGE and FY 2004 petroleum consumption was 1,288,405 GGE. This represents a savings of 233,554 GGE in FY 2004 compared to the 1999 baseline (a 15.3 percent reduction in fuel use).

Alternative Fuel Use by NASA in FY 2004

Table 1 presents alternative fuel use data for NASA's fleet in FY 2004. The majority of vehicles acquired by NASA and other Federal fleets are leased from GSA, and the leasing contract folds in the maintenance and fuel costs for the vehicles. This is accomplished by the use of a GSA credit card that the fleets use to purchase alternative fuel. However, since product code standards are not uniform among suppliers of alternative fuels (e.g., ethanol or E-85), it is difficult for credit vendors to accurately track the purchase of alternative fuels with this credit card. The exception may be natural gas, which is usually purchased at a local utility refueling site, allowing the fleets to contact the utility for an accurate accounting of purchased fuel. Thus,

alternative fuel use data is approximated from proportioning GSA data and internal record keeping efforts. Attachment D provides detail on covered petroleum use and alternative fuel use.

The greatest contribution to petroleum reduction is expected to be achieved by use of alternative fuels. Therefore, NASA is aggressively seeking to procure AFV fueling infrastructure, and education efforts are underway to familiarize drivers and all fleet personnel with alternative fuel technologies. In locations with access to alternative fuels, credit cards have been coded to disallow fueling of flex or bi-fuel vehicles with petroleum. This approach will ensure 100% use of alternative fuel in those vehicles.

Table 1. NASA Fuel Use in FY 2004

Fuel Type	Quantity	Unit
Biodiesel – B100	26,215	Gallons
CNG	24,461	Gallons @ 2,400 psi, 70^{o}F
Diesel	172,730	Gallons
E-85	32,707	Gallons*
Gasoline	1,115,675	Gallons
Propane	8,557	Gallons

* Estimate based on incomplete data

Summary

As detailed in this report and the attachments, NASA exceeded the AFV acquisition requirements of EPAct in FY 2004 and projects to repeat this accomplishment in FYs 2005 and 2006. In addition, NASA fleets were able to reduce the agency's annual fleet petroleum consumption by 233,554 GGE in FY 2004. Part of this reduction was achieved by the 2.6 mpg fleet average fuel economy in FY 2004 for covered, conventional petroleum light-duty vehicles. Further petroleum reduction was achieved by using alternative fuels for 27.5% of the operation of AFVs, an increase of 18.1% over FY 2003.

NASA will continue to implement its strategy for complying with the requirements of Executive Order 13149, which will result in at least a 20 percent reduction in the fleet's annual petroleum consumption in FY 2005.

Attachment A
National Aeronautics and Space Administration
Fiscal Year (FY) 2004
Actual Vehicle Acquisitions

Light-Duty Vehicle Acquisitions					
		Leased	Purchased	Total	Total Vehicle Inventory
Total number of Light-Duty (8,500 GVWR)		304	4	308	2,520
Exemptions	Fleet Size	0	0	0	0
	Geographic	10	4	14	103
	Law Enforcement	49	0	49	83
	Non-MSA Operation (fleet)	78	0	78	501
	Non-MSA Operation (vehicles)	0	0	0	*(n/a)*
EPACT Covered Acquisitions		**167**	**0**	**167**	**1,833**

AFV Acquisitions					
Vehicle		Leased	Purchased	Total	Total Vehicle Inventory
Sedan	CNG Bi-Fuel Subcompact	3	0	3	48
Sedan	CNG Dedicated Subcompact	1	0	1	11
Sedan	E-85 Flex-Fuel Subcompact	2	0	2	2
Sedan	CNG Bi-Fuel Compact	1	0	1	34
Sedan	E-85 Flex-Fuel Compact	53	0	53	107
Sedan	E-85 Flex-Fuel Midsize	8	0	8	52
Sedan	CNG Dedicated Large	0	0	0	1
Pickup 4x2	CNG Bi-Fuel	21	0	21	77
Pickup 4x2	CNG Dedicated	2	0	2	5
Pickup 4x2	E-85 Flex-Fuel	37	0	37	95
Pickup 4x2	LPG Bi-Fuel	2	0	2	20
Pickup 4x4	CNG Bi-Fuel	13	0	13	15
Pickup 4x4	E-85 Flex-Fuel	16	0	16	17
Pickup 4x4	LPG Bi-Fuel	0	0	0	1
SUV 4x2	E-85 Flex-Fuel	16	0	16	14
SUV 4x4	E-85 Flex-Fuel	10	0	10	17
Minivan 4x2 (Passenger)	E-85 Flex-Fuel	26	0	26	242
Minivan 4x2 (Cargo)	E-85 Flex-Fuel	2	0	2	10
Van 4x2 (Passenger)	E-85 Flex-Fuel	0	0	0	1
Van 4x2 (Cargo)	CNG Bi-Fuel	1	0	1	4
Van 4x2 (Cargo)	LPG Bi-Fuel	0	0	0	10
Ambulance	LPG Bi-Fuel	0	0	0	1
Bus	CNG Bi-Fuel	0	0	0	1
Pickup MD	CNG Bi-Fuel	7	0	7	9
Van MD (Passenger)	CNG Bi-Fuel	22	0	22	35
Van MD (Passenger)	CNG Dedicated	0	0	0	5
Van MD (Cargo)	CNG Bi-Fuel	23	0	23	34
Van MD (Cargo)	CNG Dedicated	3	0	3	7
Van MD (Cargo)	LPG Bi-Fuel	0	0	0	5
MD 8,501-16,000 GVWR	CNG Bi-Fuel	0	0	0	2
MD 8,501-16,000 GVWR	LPG Bi-Fuel	0	0	0	1
Total Number of AFV Acquisitions		**269**	**0**	**269**	**883**
Zero Emission Vehicle Credits		0	0	0	
Dedicated Light-Duty AFV Credits		3	0	3	
Dedicated Medium-Duty AFV Credits		6	0	6	
Dedicated Heavy-Duty AFV Credits		0	0	0	
Biodiesel Fuel Usage Credits - Actuals				52	
Total AFV Acquisitions with Credits		**278**	**0**	**330**	
AFV Percentage of Covered Light-Duty Vehicle Acquisition				**198%**	

Attachment B
National Aeronautics and Space Administration
Fiscal Year (FY) 2005
Planned Vehicle Acquisitions

Light-Duty Vehicle Acquisitions

		Leased	Purchased	Total
Total number of Light-Duty (8,500 GVWR) - Vehicle Acquisitions		603	13	616
Exemptions	Fleet Size	0	0	0
	Geographic	31	0	31
	Law Enforcement	39	1	40
	Non-MSA Operation (fleet)	101	3	104
	Non-MSA Operation (vehicles)	0	0	0
EPACT Covered Acquisitions		**432**	**9**	**441**

AFV Acquisitions

Vehicle		Leased	Purchased	Total
Sedan	CNG Bi-Fuel Subcompact	8	0	8
Sedan	E-85 Flex-Fuel Subcompact	4	0	4
Sedan	CNG Bi-Fuel Compact	2	0	2
Sedan	E-85 Flex-Fuel Compact	166	0	166
Sedan	E-85 Flex-Fuel Midsize	12	0	12
Sedan	CNG Dedicated Large	1	0	1
Pickup 4x2	CNG Bi-Fuel	14	0	14
Pickup 4x2	E-85 Flex-Fuel	86	0	86
Pickup 4x2	LPG Bi-Fuel	0	2	2
Pickup 4x4	E-85 Flex-Fuel	10	0	10
SUV 4x2	E-85 Flex-Fuel	2	0	2
SUV 4x4	E-85 Flex-Fuel	20	1	21
Minivan 4x2 (Passenger)	CNG Bi-Fuel	2	0	2
Minivan 4x2 (Passenger)	E-85 Flex-Fuel	69	0	69
Minivan 4x2 (Cargo)	E-85 Flex-Fuel	11	0	11
Van 4x2 (Passenger)	E-85 Flex-Fuel	45	0	45
Van 4x2 (Cargo)	CNG Bi-Fuel	31	0	31
Bus	CNG Dedicated	1	0	1
Pickup MD	CNG Bi-Fuel	5	0	5
Pickup MD	LPG Bi-Fuel	0	2	2
Van MD (Passenger)	CNG Bi-Fuel	8	0	8
Van MD (Cargo)	CNG Bi-Fuel	18	0	18
Van MD (Cargo)	LPG Bi-Fuel	2	2	4
MD 8,501-16,000 GVWR	CNG Bi-Fuel	6	2	8
HD 16,001 + GVWR	CNG Dedicated	1	0	1
Total Number of AFV Acquisitions		**524**	**9**	**533**
Zero Emission Vehicle Credits		0	0	0
Dedicated Light-Duty AFV Credits		1	0	1
Dedicated Medium-Duty AFV Credits		2	0	2
Dedicated Heavy-Duty AFV Credits		3	0	3
Biodiesel Fuel Usage Credits - Planned				45
Total AFV Acquisitions with Credits		**530**	**9**	**584**
AFV Percentage of Covered Light-Duty Vehicle Acquisition				**132%**

Attachment C
National Aeronautics and Space Administration
Fiscal Year (FY) 2006
Projected Vehicle Acaquistions

Light-Duty Vehicle Acquisitions

		Leased	Purchased	Total
Total number of Light-Duty (8,500 GVWR) - Vehicle Acquisitions		406	8	414
Exemptions	Fleet Size	0	0	0
	Geographic	12	0	12
	Law Enforcement	34	0	34
	Non-MSA Operation (fleet)	99	6	105
	Non-MSA Operation (vehicles)	0	0	0
EPACT Covered Acquisitions		**261**	**2**	**263**

AFV Acquisitions

Vehicle		Leased	Purchased	Total
Sedan	CNG Bi-Fuel Subcompact	7	0	7
Sedan	CNG Dedicated Subcompact	2	0	2
Sedan	E-85 Flex-Fuel Subcompact	6	0	6
Sedan	E-85 Flex-Fuel Compact	72	2	74
Sedan	E-85 Flex-Fuel Midsize	9	0	9
Pickup 4x2	CNG Bi-Fuel	9	0	9
Pickup 4x2	E-85 Flex-Fuel	94	0	94
Pickup 4x4	E-85 Flex-Fuel	14	0	14
SUV 4x2	E-85 Flex-Fuel	1	0	1
SUV 4x4	E-85 Flex-Fuel	20	0	20
Minivan 4x2 (Passenger)	CNG Bi-Fuel	4	0	4
Minivan 4x2 (Passenger)	E-85 Flex-Fuel	69	0	69
Minivan 4x2 (Cargo)	E-85 Flex-Fuel	4	0	4
Van 4x2 (Passenger)	E-85 Flex-Fuel	38	0	38
Van 4x2 (Cargo)	CNG Bi-Fuel	25	0	25
Pickup MD	CNG Bi-Fuel	13	0	13
Pickup MD	LPG Bi-Fuel	0	3	3
Van MD (Passenger)	CNG Bi-Fuel	9	0	9
Van MD (Cargo)	CNG Bi-Fuel	25	0	25
Van MD (Cargo)	LPG Bi-Fuel	0	3	3
MD 8,501-16,000 GVWR	CNG Bi-Fuel	19	0	19
Total Number of AFV Acquisitions		**440**	**8**	**448**
Zero Emission Vehicle Credits		0	0	0
Dedicated Light-Duty AFV Credits		2	0	2
Dedicated Medium-Duty AFV Credits		0	0	0
Dedicated Heavy-Duty AFV Credits		0	0	0
Biodiesel Fuel Usage Credits - Projected				49
Total AFV Acquisitions with Credits		**442**	**8**	**499**
AFV Percentage of Covered Light-Duty Vehicle Acquisition				**190%**

Attachment D

National Aeronautics and Space Administration
Fiscal Year FY 2004
Petroleum Consumption Report

EO 13149 Covered Petroleum Consumption in GGE

	FY 1999 Baseline	FY2000	FY2001	FY2002	FY2003	FY2004
Gasoline	1,248,163	1,211,832	1,112,032	1,122,625	1,135,805	1,115,675
Diesel	273,796	212,025	216,041	188,405	81,364	110,087
Diesel component from biodiesel		7,396	0	6,315	54,292	62,643
TOTAL	1,521,959	1,431,253	1,328,073	1,317,344	1,271,461	1,288,405
Reduction* **	N/A	6.0 %	12.7 %	13.4 %	16.5 %	15.3 %

* Reduction is the % reduction compared to the FY 1999 Baseline Total

** During the FY 2004 FAST session, NASA determined 13,275 GGE gasoline and 30,603 GGE of diesel had not been included in their FY 1999 baseline, and not previously reported. As such, NASA's baseline was adjusted to reflect this additional petroleum consumption. NASA continues to make significant progress towards meeting the goals of EPAct 1992 and E.O. 13149.

Alternative Fuel Consumption (in GGE)

	FY2000	FY2001	FY2002	FY2003	FY2004
CNG	5,674	21,166	26,890	17,314	24,461
LNG	0	0	0	0	0
LPG	0	908	131	2,576	8,557
E-85	6,283	59,552	14	860	32,707
Electric	0	0	0	0	0
M-85	8,593	0	0	0	0
Biodiesel (B100)*	1,849	0	2,492	29,618	26,215
TOTAL	22,399	81,626	29,527	50,368	91,939
Estimated Total Fuel Used in AFVs	*	*	175,750	220,353	238,192
% of Alt Fuel Use in AFVs w/o biodiesel[1]			15.382 %	9.4167 %	27.593 %

*Biodiesel is calculated at 20% of the reported B20 and 100% of the reported B100 fuel used in the Section III Actual Fuel.

Average Fuel Economy of non-AFV Light Duty Vehicle Acquisitions (in mpg)

	FY 1999 Baseline	FY2000	FY2001	FY2002	FY2003	FY2004
Fuel Economy	18	0	26.5	19	21.1	20.6
Change Compared to Baseline			8.5	1	3.1	2.6